

Job Demands Analysis – Automated Garbage Truck Operator

Purpose of Job

The automated garbage truck operator is responsible for picking up residential garbage according to a pre-assigned route.

Essential Duties

The automated garbage truck operator has 3 essential duties:

	% of Shift/Hrs
Duty #1- Vehicle Inspections (pre-trip and post-trip)	30 mins
Duty #2 - Driving (to & from beat)	2 hr max
Duty #3 – Garbage collection and dumping	5-6 hrs

Description of Non Essential Tasks

The automated garbage truck operator may also be called upon to perform other, non-essential duties from time to time. These duties may include:

- Keeping the inside of the truck clean (done on an ongoing basis).
- Washing the outside of the truck with a power washer at the wash station (usually done twice a month)

Summary of Demands

	Sedentary	Light	Medium	Heavy	Very Heavy	Comments
Physical			✓			Strength requirements & frequency
Cognitive				✓		Driving requirements

Shift Structure

All operators work day shift from 7am – 3:30pm, M-F. There is a 30 minute lunch break and two 10 minute coffee breaks that operators can take at their discretion. There is no weekend work, no nights and overtime is extremely rare.

Frequency Rating Definitions

The frequency rating definitions used in the Summary Table are from the Dictionary of Occupational Titles (DOT, 1991, 4th edition) published by the US Department of Labor. A similar classification is used for each Essential Duty, but the percentages are changed to reflect % of Duty rather than % of shift.

	Time per Day	Percentage of Shift
Never	0 minutes	0 %
Rare	0 - 5 minutes	0-1 %
Infrequent	6 - 25 minutes	2-5 %
Occasional	26 minutes – 2.5 hours	6-33 %
Frequent	2.6 - 5.25 hours	34-66 %
Constant	5.26 - 8 hours	67-100 %

STRENGTH	
Strength Category	Weight Handled
1. Limited	Up to 5 kg.
2. Light	5 kg. to 10 kg.
3. Medium	10 kg. to 20 kg.
4. Heavy	>20 kg

Job Demands Analysis – Automated Garbage Truck Operator: Summary Table

a. Physical Demands		Frequency During Shift					Weight		Comments	
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)		Max (kg)
Strength	Lifting – Floor to Knuckle		x					13.5	80	D3-tipped over tote or additional service pick up NOTE: weight of tote may be 159kg (max) but force to tilt it up calculated to be ~ 80kg
	Lifting – Knuckle to Waist		x					15	20	D3-additional service pick up
	Lifting – Over Shoulder	x								
	Carrying – with Handles	x								
	Carrying – without Handles		x					15	20	D3- additional service pick up
	Pushing – Upper Extremity		x					15	90	D3- pushing down to tilt up heavy tote, pushing pack out totes
	Pushing – Hips/Legs assist		x					15	20	D3 - pack outs if heavy tote
	Pulling – Upper Extremity		x					10	20	D3- moving tote for pack outs
	Pulling – Hip/Leg Assist	x								
Mobility	Reach - Shoulder or Above		x							D3-accessing GPS unit
	Reach - Below Shoulder		x							D2- accessing gear controls and seat controls
	Handling						x			D2,D3 - steering wheel and joystick
	Fine finger movements					x				D3 - manipulating joystick controls
	Neck - Static Flexion		x							
	Neck – Static Neutral				x					D2 - driving to and from beat
	Neck – Static Extension		x							D3 - viewing GPS
	Neck – Rotation					x				D2, D3 - looking out right side mirror to monitor tote lift and when operating vehicle
	Throwing	x								
	Sitting						x			D2, D3 - sitting in truck
	Standing		x							D1 - brief pauses to stand and check eqpt
	Walking		x							D1, D3 - vehicle inspections and pack out
	Running/Jumping	x								
	Climbing		x							D1, D3 - in/out of vehicle cab
	Bending/Stooping		x							D1 - inspecting low parts of truck
	Crouching		x							D1 - inspecting underneath of vehicle
	Kneeling	x								
	Crawling	x								
	Twisting		x							D1, D3 - inspecting awkward areas of vehicle, manoeuvring totes for pack outs
	Balancing	x								
Travelling						x			D2, D3	

Job Demands Analysis – Automated Garbage Truck Operator: Summary Table

(cont)

a. Physical Demands (continued)		Frequency During Shift						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations			x				D1, D2, D3 - with co-workers & supervisor, over radio, and occasionally with customers
	Hear/Other Sounds						x	D2, D3 - awareness of road noise, sirens, etc
	Vision/Far						x	D1, D2, D3
	Vision/Near						x	D1, D2, D3
	Vision/Colour						x	D1, D2, D3
	Vision/Depth						x	D1, D2, D3
	Perception/Spatial						x	D3 - using mirrors to line up tote with claw
	Perception/Form		x					
	Feeling	x						
	Speech			x				D1, D2, D3 - with co-workers & supervisor, over radio, and occasionally with customers
Work Environment	Inside Work						x	D2, D3 - inside cab of truck
	Outside Work				x			D1, D3 - inspections and pack out
	Slippery		x					D1, D3 - only in poor weather
	Congested worksite						x	D2, D3 - traffic, pedestrians, obstacles, etc
	Chemical Irritants		x					D3 - if contaminated load
	Confined Space Entry	x						
	Vapour Fumes				x			D2, D3 - exhaust and garbage if windows down
	Noise						x	D2, D3
	Proximity to moving objects					x		D2, D3 - other vehicles, pedestrians, etc
	Hazardous Machines	x						
	Electrical hazard	x						
	Hazardous objects		x					D3 - if contaminated load
	Radiant/Thermal Energy	x						
	Hot/Cold		x					D1 - depending on weather
	Humid		x					D1 - depending on weather
	Environmental Dust		x					D3 - if contaminated load
	Organic Substances		x					D3 - if contaminated load
	Medical Waste	x						
	Blood Products	x						
	Lighting – Direct			x				D1,D2,D3 - low light in early morning at certain times of year, sun glare depending on weather
	Lighting – Indirect		x					
	Vibration – Whole Body						x	D2, D3 - vehicle motion
	Vibration – Hand/Arm	x						

b. Cognitive and Psychosocial Demands	Frequency During Shift			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision	x			
Time Pressure	x			D2, D3- except in case of poor weather or vehicle breakdown
Attention to Detail			x	D1, D2 - inspections, avoiding obstacles in narrow laneways
Memory Requirements			x	D2 - remembering beat route, pack out locations
Interact with co-workers	x			
Interact with public	x			
Work Alone			x	
Reading		x		D2 - street signs, maps
Writing	x			
Irregular Hours	x			
Operating Equipment			x	D2, D3 - vehicle and pick up arm controls

Physical Environment Description

The work takes place outside in the Manitoba Works Yard and inside the cab of the automated garbage truck. The employee is sitting inside the truck for most of the shift.

Staffing Levels (work alone/teams/etc)

The automated garbage truck operator works alone. He requires assistance from another employee only during pre and post trip inspections when someone else gets in the cab to press the brake pedal while he checks brake function.

Tools and Equipment Used

Apart from the driving controls, the garbage truck is also equipped with a specialized joystick control for operating the automated arm. There is also a GPS system, and LCD screen which shows views from the 4 cameras mounted around the outside of the truck. There is also a centre console that contains the dump controls and hydraulic operations. Operators may also use a rag to clean cameras and lights.

Other Equipment

The operator must wear CSA approved boots at all times. When working outside the vehicle he must also wear a safety vest, gloves and ear plugs.

Data Collection:

Mandy Gallant, an ergonomic consultant from ErgoRisk Management Group conducted the JDA assessment over the course of two days (Mar 13 & 14, 2008). Data was collected using a tape measure, stopwatch, digital camera and through observation and discussion with a selected employee and the on-site supervisor.

Contact for On-Site Assessment: Jeremy Herd, Superintendent of Collections

Description of Essential Duties

This section describes the work tasks that comprise the 3 essential duties of the job. Tables (located at the end of this report) provide the physical, cognitive and psychosocial demands for performing each of the essential duties.

Essential Duty 1: Pre-Trip & Post Trip Inspections

Pre-Trip Inspection is performed on the truck before it leaves the yard each morning. Operators check a variety of essential components including fluid levels, hoses, belts, and the hydraulic system (Fig 1 – 3). They look for leaks, and make sure air pressure levels are appropriate. They check that vehicle lights and cameras are functioning and wiped clean. They make sure the truck has adequate gasoline, and check vehicle brakes are functioning. They also make sure a fire extinguisher is present in the cab and that inspection stickers are up to date. They check the tote lift system is working well and other necessary aspects of vehicle operation.

At the end of the shift the same things are checked, although since the vehicle has been in operation during the day, some of the components that have been in use, such as the automated arm do not have to be rechecked.

If deficiencies are noted at either inspection or during the course of the day the truck is logged in for repair at the end of the shift. If deficiencies on pre-trip inspection affect the safe operation of the vehicle then the truck is logged in immediately and a different truck is taken out for the day.



Fig 1: Pre-trip inspection



Fig. 2: Pre-Trip checking oil



Fig 3: Pre-Trip inspection

Essential Duty 2: Driving

Operators drive to and from their assigned neighbourhoods before beginning collection duties. They also drive the truck along the beat route during collection.

Essential Duty 3: Garbage Collection and Dumping

Essential Duty 3 is garbage collection and dumping. The operator drives from house to house and uses a joystick to control the operation of the automated tote lift to pick up and dump garbage into the hopper. When the hopper is full the operator drives to the transfer station for dumping. Typically a dump occurs twice each day, once mid-shift and again at the end of the shift. The sub-tasks that make up this essential duty are:

- Operators use joystick controls inside the truck cab to operate the claw and arm that picks up and dumps the totes (Fig 4).
- Operators visually monitor each pick up by looking in either the vehicle right side mirror or by looking at the LCD monitor mounted near the top of the sun visor (Fig 5).
 - Cameras on the outside of the vehicle are oriented to show the automated arm, the rear of the vehicle, the inside of the hopper and the left side of

the vehicle. Operators can manually choose what camera they want to view.

- Once the load is dumped the camera defaults to the inside of the hopper view for a few seconds so the operator can visually assess the load and see if there are inappropriate materials included (Fig 6).
- If a house is noted to have a problem such as a contaminated load, or inaccessible tote placement, the operator may flag the house using a GPS system mounted on inside the roof of the cab (Fig 7).
- If a tote has fallen over, or a pack out or additional services is required the operator will climb out of the cab and manually move and position the tote for pick up (Fig 8 & 9)
- Before dumping at the transfer station, the operator manually removes 2 locking pins from the rear of the truck. The truck then backs up on the tipping floor to the edge of garbage pit. Using controls on the centre console of the truck he moves the arm out of the way, and raises the back and dumps the garbage into the pit (Fig 10). The dumping process takes approximately 2 minutes.



Fig 4: Joystick Control



Fig 5: Mirror check of claw operation



Fig 6: Viewing LCD screen to monitor claw operation and hopper contents.



Fig 7: Accessing GPS unit



Fig 8: Lifting a fallen tote



Fig 9: Manually positioning a tote



Fig 10: Accessing dump controls

Essential Duty 1: Automated Garbage Truck Operator – Pre/Post Trip Inspection

b. Physical Demands		Frequency During Shift					Weight		Comments
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)	
Strength	Lifting – Floor to Knuckle	x							
	Lifting – Knuckle to Waist	x							
	Lifting – Over Shoulder	x							
	Carrying – with Handles	x							
	Carrying – without Handles	x							
	Pushing – Upper Extremity	x							
	Pushing – Hips/Legs assist	x							
	Pulling – Upper Extremity	x							
	Pulling – Hip/Leg Assist	x							
Mobility	Reach - Shoulder or Above		x						Cleaning cameras or lights
	Reach - Below Shoulder				x				Checking low parts of vehicle (brakes/tires)
	Handling				x				
	Fine finger movements	x							
	Neck - Static Flexion	x							
	Neck – Static Neutral	x							
	Neck – Static Extension	x							
	Neck – Rotation				x				Viewing awkward areas around the vehicle
	Throwing	x							
	Sitting	x							
	Standing				x				When checking components
	Walking					x			Around vehicle
	Running/Jumping	x							
	Climbing			x					In/out of vehicle cab
	Bending/Stooping				x				
	Crouching			x					
	Kneeling	x							
	Crawling	x							
	Twisting				x				
	Balancing	x							
Travelling	x								

Frequency Rating Definition for % of Task

The definitions for frequency ratings are contained at the end of the Table (page 16).

**Essential Duty 1: Automated Garbage Truck Operator – Pre/Post Trip Inspection
 (continued)**

c. Physical Demands (continued)		Frequency During Shift						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations			x				Checking brakes only
	Hear/Other Sounds						x	For safety -awareness of other vehicles
	Vision/Far					x		
	Vision/Near					x		
	Vision/Colour					x		
	Vision/Depth					x		
	Perception/Spatial		x					
	Perception/Form		x					
	Feeling	x						
	Speech			x				Checking brakes only
Work Environment	Inside Work			x				Filling out log sheet
	Outside Work						x	
	Slippery				x			Depending on weather
	Congested worksite		x					
	Chemical Irritants	x						
	Confined Space Entry	x						
	Vapour Fumes					x		Vehicle exhaust
	Noise						x	
	Proximity to moving objects				x			Checking arm and claw operation
	Hazardous Machines	x						
	Electrical hazard	x						
	Hazardous objects	x						
	Radiant/Thermal Energy	x						
	Hot/Cold				x			Weather dependent
	Humid				x			Weather dependent
	Environmental Dust	x						
	Organic Substances	x						
	Medical Waste	x						
	Blood Products	x						
	Lighting – Direct					x		Low lighting in the early morning at certain times of the year
	Lighting – Indirect			x				Few minutes when inside filling out log sheet
	Vibration – Whole Body	x						
	Vibration – Hand/Arm		x					When touching certain parts of the vehicle when air compressor running

Essential Duty 1: Automated Garbage Truck Operator – Pre/Post Trip Inspection
 (continued)

d. Cognitive and Psychosocial Demands	Frequency During Shift			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision	x			
Time Pressure	x			
Attention to Detail			x	
Memory Requirements			x	
Interact with co-workers		x		
Interact with public	x			
Work Alone			x	
Reading	x			
Writing		x		Filling out log sheet
Irregular Hours	x			
Operating Equipment		x		Testing tote lift arm

Frequency Rating Definitions for % of Task

The frequency rating definitions are from the Dictionary of Occupational Titles (DOT, 1991, 4th edition) published by the US Department of Labor.

	Percentage of Task
Never	0 %
Rare	0-1 %
Infrequent	2-5 %
Occasional	6-33 %
Frequent	34-66 %
Constant	67-100 %

STRENGTH	
Strength Category	Weight Handled
5. Limited	Up to 5 kg.
6. Light	5 kg. to 10 kg.
7. Medium	10 kg. to 20 kg.
8. Heavy	>20 kg

Essential Duty 2: Automated Garbage Truck Operator – Driving

c. Physical Demands		Frequency During Shift					Weight		Comments
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)	
Strength	Lifting – Floor to Knuckle	x							
	Lifting – Knuckle to Waist	x							
	Lifting – Over Shoulder	x							
	Carrying – with Handles	x							
	Carrying – without Handles	x							
	Pushing – Upper Extremity	x							
	Pushing – Hips/Legs assist	x							
	Pulling – Upper Extremity	x							
	Pulling – Hip/Leg Assist	x							
Mobility	Reach - Shoulder or Above	x							
	Reach - Below Shoulder		x						Adjust seat controls and gears
	Handling						x		Steering Wheel
	Fine finger movements	x							
	Neck - Static Flexion	x							
	Neck – Static Neutral					x			Looking at road ahead
	Neck – Static Extension	x							
	Neck – Rotation				x				Checking mirrors
	Throwing	x							
	Sitting						x		
	Standing	x							
	Walking	x							
	Running/Jumping	x							
	Climbing	x							
	Bending/Stooping	x							
	Crouching	x							
	Kneeling	x							
	Crawling	x							
	Twisting		x						Adjust seat controls and gears
	Balancing	x							
Travelling						x			

Essential Duty 2: Automated Garbage Truck Operator – Driving (continued)

e. Physical Demands (continued)		Frequency During Shift						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations		x					Occasional radio calls
	Hear/Other Sounds						x	Traffic noise, sirens, horns, etc
	Vision/Far						x	
	Vision/Near						x	
	Vision/Colour						x	
	Vision/Depth						x	
	Perception/Spatial				x			Looking in mirrors
	Perception/Form		x					
	Feeling	x						
	Speech		x					Occasional responding to radio calls
Work Environment	Inside Work						x	
	Outside Work	x						
	Slippery				x			Depending on weather/road conditions
	Congested worksite						x	Traffic and narrow laneways
	Chemical Irritants	x						
	Confined Space Entry	x						
	Vapour Fumes				x			Exhaust and other fumes if windows down
	Noise						x	
	Proximity to moving objects					x		Other vehicles
	Hazardous Machines	x						
	Electrical hazard	x						
	Hazardous objects	x						
	Radiant/Thermal Energy	x						
	Hot/Cold	x						
	Humid	x						
	Environmental Dust		x					If windows down and driving past construction site or dusty material in hopper
	Organic Substances	x						
	Medical Waste	x						
	Blood Products	x						
	Lighting – Direct			x				Dependent on weather and time of day/year
	Lighting – Indirect	x						
	Vibration – Whole Body						x	
Vibration – Hand/Arm	x							

Essential Duty 2: Automated Garbage Truck Operator – Driving (continued)

f. Cognitive and Psychosocial Demands	Frequency During Shift			Comments
	Never / Rare	Infrequent / Occasional	Frequent / Constant	
Degree of Supervision	x			
Time Pressure	x			Unless breakdown or poor weather slowing work pace
Attention to Detail			x	
Memory Requirements			x	Remembering beat
Interact with co-workers	x			
Interact with public	x			
Work Alone			x	
Reading			x	Street signs, map
Writing	x			
Irregular Hours	x			
Operating Equipment			x	

Frequency Rating Definitions for % of Task

The frequency rating definitions are from the Dictionary of Occupational Titles (DOT, 1991, 4th edition) published by the US Department of Labor.

	Percentage of Task
Never	0 %
Rare	0-1 %
Infrequent	2-5 %
Occasional	6-33 %
Frequent	34-66 %
Constant	67-100 %

STRENGTH	
Strength Category	Weight Handled
9. Limited	Up to 5 kg.
10. Light	5 kg. to 10 kg.
11. Medium	10 kg. to 20 kg.
12. Heavy	>20 kg

Essential Duty 3: Automated Garbage Truck Operator - Garbage Collection & Dumping

d. Physical Demands		Frequency During Shift					Weight		Comments	
		Never	Rare	Infrequent	Occasional	Frequent	Constant	Usual (kg)		Max (kg)
Strength	Lifting – Floor to Knuckle		x					13.5	80	Tipped over tote or additional service pick up NOTE: weight of tote may be 159kg (max) but force to tilt it up calculated to be ~ 80kg
	Lifting – Knuckle to Waist		x					15	20	Additional service pick up
	Lifting – Over Shoulder	x								
	Carrying – with Handles	x								
	Carrying – without Handles		x					15	20	Additional service pick up
	Pushing – Upper Extremity		x					15	90	Pushing down to tilt up heavy tote, pushing pack out totes
	Pushing – Hips/Legs assist		x						20	Pack outs if heavy tote
	Pulling – Upper Extremity		x						20	Moving tote for pack outs
	Pulling – Hip/Leg Assist	x								
Mobility	Reach – Shoulder or Above		x							To access controls from outside the truck if a tote has fallen over and been manually positioned, accessing GPS unit
	Reach – Below Shoulder	x								
	Handling						x			Joystick controls with left hand, steering wheel with right hand or both hands. Manual tote movement or hand bombing additional service.
	Fine finger movements						x			Joystick controls with left hand
	Neck - Static Flexion		x							
	Neck – Static Neutral				x					
	Neck – Static Extension				x					Viewing LCD monitor
	Neck – Rotation					x				Rotation right to view side mirror
	Throwing	x								
	Sitting							x		
	Standing	x								
	Walking		x							Additional Service and pack outs
	Running/Jumping	x								
	Climbing		x							In/out of truck for pack out and additional service
	Bending/Stooping	x								
	Crouching	x								
	Kneeling	x								
	Crawling	x								
Twisting		x							When moving a tote that has fallen or turning to face dump control panel.	
Balancing	x									
Travelling							x			

Essential Duty 3: Automated Garbage Truck Operator - Garbage Collection & Dumping (continued)

g. Physical Demands (continued)		Frequency During Shift						Comments
		N	R	I	O	F	C	
Sensory / Perception	Hear/Conversations	x						
	Hear/Other Sounds						x	Horns, sirens and other road noise
	Vision/Far						x	
	Vision/Near						x	
	Vision/Colour						x	
	Vision/Depth						x	
	Perception/Spatial						x	Lining up tote with claw in mirror
	Perception/Form		x					
	Feeling	x						
	Speech	x						
Work Environment	Inside Work						x	Inside cab of vehicle
	Outside Work		x					To pick up pack outs or fallen totes or additional service
	Slippery		x					Weather dependent – rain/snow/etc
	Congested worksite					x		Narrow alleys, poorly placed totes, other obstacles
	Chemical Irritants		x					If improperly disposed of by customers
	Confined Space Entry	x						
	Vapour Fumes		x					
	Noise						x	Vehicle noise and other road noise
	Proximity to moving objects	x						
	Hazardous Machines	x						
Electrical hazard	x							
Hazardous objects		x						If improperly disposed of by customers on pack out or additional service
Radiant/Thermal Energy	x							
Hot/Cold	x							
Humid	x							
Environmental Dust		x						If improperly disposed of by customers
Organic Substances		x						If improperly disposed of by customers
Medical Waste	x							
Blood Products	x							
Lighting – Direct			x					Low lighting depending on weather and time of day/year.
Lighting – Indirect	x							
Vibration – Whole Body						x		Vehicle vibration
Vibration – Hand/Arm	x							

Essential Duty 3: Automated Garbage Truck Operator - Garbage Collection & Dumping (continued)

h. Cognitive and Psychosocial Demands	Frequency During Shift			Comments
	Never / Rare	Infrequent	Frequent	
Degree of Supervision	x			
Time Pressure	x			Unless breakdown or poor weather slows work pace
Attention to Detail			x	Lining lift arm up with tote
Memory Requirements	x			Remembering pack out addresses
Interact with co-workers	x			
Interact with public	x			
Work Alone			x	
Reading	x			
Writing	x			
Irregular Hours	x			
Operating Equipment			x	

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